

WHAT IS CLAIMED IS:

1. An element mapping unit that generates a distribution image of an element contained in an object to be analyzed on the basis of the energy spectrum of the electron beam transmitted through the object to be analyzed and the irradiation position of the electron beam on the object to be analyzed; comprising of

an accelerating tube that accelerates the electron beam transmitted through the object to be analyzed;

an electron spectrometer that analyzes into spectrum the energy of the electron beam transmitted through the object to be analyzed;

an electron beam detector that detects the intensity of the electron beam; and

a control unit that controls the accelerating tube so that the electron beam, which has lost specific energy corresponding to the element to be analyzed, enters into a fixed position in the electron beam detector;

and detects the element to be analyzed on the basis of the intensity of the electron beam within a predetermined energy range out of those electron beam intensities detected above.

2. An element mapping unit according to Claim 1, wherein

the control unit contains a storage section that stores in memory the acceleration voltage for accelerating the electron beam that has lost specific energy and the

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the control unit detects the 1st electron beam intensity detected by the electron beam detecting section corresponding to the 1st energy range and the 2nd electron beam intensity detected by the electron beam detecting section corresponding to the 2nd energy range on the basis

the computation section divides the 1st electron beam intensity by the 2nd electron beam intensity so as to detect the element to be analyzed.

5. An element mapping unit according to Claim 2, wherein the electron beam detector contains multiple electron beam detecting sections corresponding to the electron beam energy;

the storage section stores the 1st energy range, which is a range including the core loss energy and core loss peak, and the 2nd and 3rd energy ranges, which are two ranges each smaller than the core loss energy, out of an inner shell electron energy loss spectrum of the element to be analyzed;

the control unit detects the 1st electron beam intensity detected by the electron beam detecting section corresponding to the 1st energy range, 2nd electron beam intensity detected by the electron beam detecting section corresponding to the 2nd energy range, and 3rd electron beam intensity detected by the electron beam detecting section corresponding to the 3rd energy range on the basis of the stored 1st energy range, 2nd energy range, and 3rd energy range;

the computation section acquires the background intensity of the 1st energy range in accordance with the 2nd electron beam intensity and 3rd electron beam intensity,

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the storage section stores the plasmon energy range
10 including the plasmon peak out of the inner shell electron
energy loss spectrum of the element to be analyzed;

10 including the plasmon peak out of the inner shell electron
energy loss spectrum of the element to be analyzed;

the control unit detects the plasmon loss intensity of
the electron beam detected by the electron beam detector
corresponding to the plasmon energy range on the basis of
15 the stored plasmon loss energy range; and

the computation section detects the element to be
analyzed on the basis of the detected plasmon loss
intensity.

25 detects the 1st element on the basis of the 1st
electron beam intensity in a predetermined energy range out
of the detected 1st electron beam intensities;

when the 2nd element to be analyzed is inputted from the outside,

controls the accelerating tube so that the 2nd electron beam, which has lost specific energy corresponding to the 2nd element to be analyzed, enters into a fixed position in the electron beam detector; and

detects the 2nd element on the basis of the 2nd electron beam intensity in a predetermined energy range out of the detected 2nd electron beam intensities;

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8. A scanning transmission electron microscope, equipped with the element mapping unit according to Claim 1 or Claim 8, that irradiates electron beams onto an object to be analyzed and supplies the electron beams, which have transmitted through the object to be analyzed, to the element mapping unit.

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9. An element mapping method that generates a distribution image of an element contained in an object to be analyzed on the basis of the energy spectrum of the electron beam transmitted through the object to be analyzed and the irradiation position of the electron beam on the object to be analyzed; including

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a step for irradiating electron beams onto the object to be analyzed;

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a step for accelerating the electron beam transmitted through the object to be analyzed;

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the step for detecting the element includes a step for detecting the element to be analyzed on the basis of the intensity of the electron beam within a predetermined energy range out of those electron beam intensities detected above.

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a step for accelerating the electron beam so that the electron beam, which has lost specific energy corresponding to the other element, enters into a fixed position in the

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a step for detecting the other element to be analyzed on the basis of the intensity of the electron beam within a predetermined energy range corresponding to the other element out of those electron beam intensities that are detected when the electron beam, which has lost specific energy corresponding to the other element, enter into the electron beam detector.